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WHISKERED BAT (*MYOTIS MYSTACINUS*) IN CAPTIVITY.

BY CHARLES OLDHAM.

THE observation of Bats in a free state is, owing to their nocturnal habits and peculiar mode of life, a matter of considerable difficulty, and but very little is known of the economy of even our common British species. Many of their actions may be studied in captivity, but it is not easy to maintain the supply of insect food essential to the welfare of the little creatures, which seldom survive confinement long. These considerations are perhaps sufficient excuse for the publication of the following notes on a Bat which I kept alive for nearly five weeks last winter.

On Nov. 27th I obtained a male Whiskered Bat, *Myotis mystacinus* (Leisler), from one of the tunnels of the disused copper mines on Alderley Edge. It would not eat some mealworms I offered it, although it greedily lapped water from a camel-hair pencil and from the palm of my hand. Five days later, after many unsuccessful attempts to induce the Bat to feed, I procured some moths (*Scotosia dubitata*) from the copper mines, and placed them in a box with it; but no attention was paid to them. On the evening of the following day I placed the Bat under a bell-jar with six of the moths, and, on going to look at it an hour afterwards, found that it had caught and eaten them all, rejecting only the wings and legs. The available supply of moths was exhausted in a few days, and I began to despair of keeping my

little captive alive, as it still ignored the mealworms, even when they crawled over its face and wings. On Dec. 5th I fastened a moth's wing to half a mealworm, and moved it about just in front of the Bat's nose. This ruse succeeded admirably; the Bat made a dash at the imitation moth, and speedily devoured the mealworm. From that time it took the mealworms readily, and soon learned to look for them if I held my finger-tips near its face. I fed it nearly every day, and for so small a creature it had an enormous appetite. On one occasion, although it had eaten seven mealworms on the previous evening, it ate, between two and eight o'clock, eight mealworms, a large spider, and six *S. dubitata*; after which it merely snapped at the moths, but would not eat them. During the ensuing night, however, it ate seven more moths which I had left with it under the bell-jar. On another evening it ate two fragments of raw rabbit, seven mealworms, one *S. dubitata*, and two thick-bodied moths (*Gonoptera libatrix*). On Dec. 28th the Bat appeared to be in good health, and ate seven mealworms. I did not feed it on the 29th, and on the morning of the following day it was hanging as though asleep, except that its legs were straight instead of flexed; but, on touching it, I found that it was dead.

The Bat bit me viciously when I took it from the roof of the tunnel and warmed it in my hand, but it never showed any temper subsequently, and in a few days had become absurdly tame. It evinced little disposition for flight, especially after feeding, and if compelled to take wing would, after one or two turns round the room, drop on to the floor, or pitch on a curtain, chair, or my head or body. When settling on a vertical surface it used to pitch head upwards, then quickly shuffle round and hang suspended by its toes in a convenient position for taking wing again. It could rise from a flat surface by making a sudden spring upwards and expanding its wings immediately. Although loth to fly, it seemed never tired of running about among the papers and other objects on the table, and was seldom stationary unless it was eating. The bell-jar in which I kept it was raised above a stand on supports rather more than $\frac{1}{4}$ in., or, to be exact, just 7 mm. in height, and whenever the perforated zinc guard was removed from the intervening space the Bat would creep out at once. The bright light of the lamp on my table seemed to cause



it no inconvenience, for it used to sit, supported on feet and wrists, eating mealworms within a few inches of the flame, and never showed any desire to retire to dark or shaded places. Sometimes it would creep under my hand, or up my sleeve, but this, I think, was on account of the sensation of warmth it experienced in nestling against my skin

The sense of sight seems to be but feeble in the Whiskered Bat. The example under notice could not see, or at all events recognize, a mealworm or wet paint-brush if more than an inch from its face. As this species is more diurnal than any other British Bat, and may frequently be seen abroad at midday in summer, the inability of my captive to see objects an inch away cannot be attributed to the dazzling effects of too strong a light, especially as this inability existed equally in the daytime and in the artificial light of a lamp. Its hearing also appeared to be dull, as it never showed by any movement of its head that it perceived a sudden noise, such as the snapping of my fingers, or the click of a watch-lid being closed. It sometimes slept prone upon the floor with wings folded and pressed closely to its sides, at other times suspended by its toes to the rim of a wooden box. During sleep, which was always profound, its temperature fell considerably, and it felt, as all Bats do in this state, extremely cold. It usually wakened in the evening, but exceptionally in the daytime without being roused; while, as a rule, it was necessary to warm it into activity by holding it for a minute or two in my hand if I wanted to feed it by daylight. It was constantly thirsty, and would readily lap milk or water even when not sufficiently roused from sleep to seize food. Its voice, often used, was a feeble squeak, less shrill than that of the Long-eared Bat.

My captive used to tuck its head away under its body directly it had seized an insect, at the same time bringing its feet forward, so far indeed that it sometimes lost its balance and toppled over on its back. This habit, practised from the very first, was evidently one of old standing, and not a trick acquired in confinement. By feeding the Bat on a sheet of glass so that I could see it from beneath, or, better still, by giving it an insect as it hung suspended by its toes, the reason of its action was at once apparent. The tail being directed forward beneath the body, the interfemoral membrane formed a pouch into which the

Bat thrust its head, and was thereby enabled to get a firmer grip of its prey without any danger of dropping it. When the Bat was on a flat surface the lower side of this pouch was pressed closer to its belly than would be the case during flight, so that it sometimes failed to get its head into the pouch, and let a mealworm drop. When this was the case it never made any attempt to seize its prey again, and the mealworm would escape by crawling out from beneath its wings or tail. When the Bat was suspended, however, the bag was wide open, and the insect never escaped. Experience seemed to teach it that the mealworms were incapable of escape by flight, and latterly it did not always thrust its head into the interfemoral pouch after seizing one, but devoured it without this preliminary. In a free state Bats, capturing the greater part, if not all, of their food on the wing, must often fail to grip large insects securely at the first bite, and it would be a manifest advantage to have some means of adjusting their hold without alighting. An insect accidentally dropped during flight could hardly be recovered, and would probably be abandoned without further thought, as was the case when my Whiskered Bat dropped a mealworm. A Long-eared Bat which I kept for a few days invariably thrust its head into the interfemoral pouch on seizing a moth. Both Long-eared and Whiskered Bats have the tail curved beneath them during flight, although they are usually figured with it held straight behind them; and I have little doubt that when on the wing they actually use the method I have described for securing their prey. Further observation will probably show that this curious habit is common to all our British species, with the possible exception of the Horseshoe Bats, in which the interfemoral membrane is comparatively small, and the tail, during repose at any rate, is carried in a very different way.

Having firmly secured its prey, whether moth or mealworm, by the head or tail, my Whiskered Bat used to swallow it lengthwise, crunching it thoroughly by rapid movements of the jaws as it slowly disappeared. Neither foot nor carpus was ever used in any way to assist it in capturing or holding an insect. The use of either would of course be quite impossible during flight. Moths and spiders moving near it were pounced upon and captured, but mealworms dissociated from my fingers seemed to

puzzle it, and only once did I see it capture one itself, although the creatures frequently crawled just before its eyes and over its wings and feet. The wings and legs of moths were always dropped, but once or twice a wing accidentally encountered in the Bat's ramble about the table was picked up and eaten. The mealworms were, as a rule, entirely consumed, but sometimes the horny heads were left.

After being fed or handled, the Bat always went through a rather elaborate toilet. It used to hang by one foot and comb the fur of its face and body with the other, often sucking its toes first, and always moving the free foot with great rapidity. It would then change the foot used for suspension, and repeat the operation. It paid much attention to the wings and interfemoral membrane, licking them inside and out, and distending the membranes by thrusting its nose among the folds. When washing itself, as well as when securing prey in the manner described above, it displayed remarkable suppleness.

Despite its cleanliness it was the host, as every Bat seems to be, of some external parasites. I removed a large tick from the upper surface of the interfemoral membrane near the root of its tail, and caught two fleas (which Mr. Edward Saunders has identified as *Typhlopsylla hexactenus*) in its fur.

ORNITHOLOGICAL NOTES FROM NORTHERN NORWAY.

BY J. H. SALTER, D.Sc.

THANKS to the numerous contributions to the subject which have appeared in 'The Zoologist' and elsewhere, the avifauna of most parts of Norway is as familiar to English naturalists as that of the Scotch Highlands. I have therefore, in writing the following notes of a month's holiday spent in the far north during the past summer, dwelt chiefly upon the points which appeared to be of interest, and have tried to avoid repetition. Tromsö, in 69° 38' N. latitude, was selected as offering facilities for making the acquaintance of certain birds of a distinctly arctic type. Ten days spent in the birch woods and on the *fjeld* tended to confirm in almost every detail the account given by Mr. O. V. Aplin (Zool. Dec. 1896), to whom I am much indebted for this and for other information. A few species were noted which Mr. Aplin failed to meet with, his visit having been paid earlier in the summer, before the snow had fully melted. On the other hand, in mid-July we found many birds silent, and hence less readily identified.

In company with a friend, I crossed from Newcastle to Bergen, the latter place being reached early on the morning of July 7th. In the grounds of the Fishery Exhibition, the Nygaards Park, but few birds were to be seen, owing to the wet. I noted the Chaffinch, White Wagtail, and very tame House Sparrows. We left at 11 p.m. in the 'Sirius' for Trondhjem, and rose next morning to find, in place of the gloomy Bergen weather, bright sunshine and blue sea. A crowd of cackling Gulls, Lesser Black-backs, hovered over our wake. In the quiet channels many Shags were perched on the rocky islets. As we rounded the Stadtland, justly dreaded for its rough seas, birds were numerous. There were many Common Guillemots. Kittiwakes appeared to be breeding on the white wave-worn rocks of the

headland, and the first Black Guillemot passed, flying low and fast just above the waves. Late in the afternoon we came to Aalesund. A stay of an hour and a half allowed of a hurried scramble about the grey rocky bluff behind the town. Here a Common Whitethroat was singing. Molde was reached at ten. We took advantage of the lingering twilight to run up to the fir woods. Robins were singing as we roamed through the forest, collecting plants and vainly hoping to stumble upon a Fieldfare colony. Next day, while passing the large island of Hiteren, haunt of the Red Deer, the first Eiders were sighted. At Beian, at the mouth of the Trondhjems Fjord, a White-tailed Eagle passed us, and was assaulted farther on by two Hooded Crows. Many of the latter species, with Common Gulls, were resting on the stones and posts of the breakwater as we came into Trondhjem Harbour. After visiting the cathedral there was time for a stroll through the town and suburbs. White Wagtails were feeding newly-fledged young upon the yellow-lichened roof of an old monastic building. A Willow Wren was singing, and the Spotted Flycatcher's note came from the black poplars. Magpies chattered from trees across the meadow. A Chiffchaff sang from a dingle below us, where in moisture and shade grew blue columbine, meadow cranesbill, and a wealth of ferns. A Whinchat was scolding as it carried food. Down by the shore many House and Sand Martins hawked about, with Swallows in smaller numbers. At 11 p.m. Robins were singing, and Swifts were still upon the wing. The sun was out of sight, but clouds in the north-west were still illuminated, and by midnight the short spell of twilight was fast giving place to daylight once more.

Next morning (July 10th) we left for the north in the 'Vesteraalen.' As we ran down the fjord a Richardson's Skua flapped low over the surface of the water. Just beyond Beian there were hosts of Eiders dotted about amongst the low grassy skerries. In the evening we were threading our way through the narrow sounds of Vigten, amidst a perfect archipelago of islets. Some of them were Eider-holms. One Duck, Eider, carried two young upon her back. Oystercatchers piped from the rocky strand. Upon two islands which were tenanted by Common Gulls, the glass showed several young in the down. As we passed Torghatten at eleven, sea and sky were still illumined with

the purple and golden hues of the northern twilight. Gulls were still playing above the shoals of fish, a Cormorant flapped along the water, and a Black Guillemot rose from a dike. Next morning, by contrast, was fresh and overcast, and as we crossed the Arctic Circle the snow-patches became more numerous. Arctic Terns passed us beating up the channel, as we neared the seaward front of the lion-like Rödö. Skuas were seen at frequent intervals, and I watched the amusing performance so often described by visitors to this coast. Screams of a Common Gull drew my attention: a Skua was hot in chase. Its tail was spread kestrel-wise, showing the projecting middle tail-feathers. It swooped and grappled, putting down its feet to tackle the Gull. The latter settled on the water, but the Skua kept making feints at it, till a Lesser Black-back joined in and chased the two. Finally the Gull reached a rock, and its persecutor sheered off.

As we steered to seaward to round the promontory of Kunnen, I heard a Whimbrel, and three Scoters flew past in company with Eiders. Numerous Puffins rose before the vessel. The islands just outside Bödö were swarming with Eiders. With them were Oystercatchers, Gulls of two or three species, and a pair of Red-throated Divers. As we anchored off the little town of Bödö, with its wharves and shipping, a Raven flew past. About 2 p.m. we saw the wild Matterhorn peaks of Kjaerring, outposts of the grand district of the Folden Fjord. The vessel steered through the Gissund, a narrow strait with clear green water. Here were whole fleets of Eiders, at least one of the old birds followed by young ones. Oystercatchers ran over the stones and seaweed; a White-tailed Eagle rose from the rocky shore, and flapped slowly past our stern. It was an immature bird, its back splashed with lighter colour, and its tail not yet white. We now steered out into the Vest Fjord, and tossed and rolled over thirty miles of open water to Svolveaer in the Lofotens. Black-backs and a Skua followed the vessel. A short run ashore added only one species, the Wheatear, to our list. Later in the evening, as we skirted this lofty coast, Herring Gulls appeared. They seem to avoid the more land-locked waters farther south, where the vessel was followed by Common Gulls and Lesser Black-backs only.

On the morning of the 12th, as we neared Tromsö, the savage

mountains gave place to gentle slopes green with grass and feathery birch wood. We had seen nothing so verdant for hundreds of miles. There was moss-fjeld with melting snow patches aloft. A flock of Arctic Terns was fishing in the channel, and a Skua in mottled plumage passed us. In the course of the morning we landed at Tromsö, after just a week of travelling. Ten days were spent there, three of them being occupied by a trip to the Lyngen Fjord, where ice-clad mountains, separated by glaciers and snow-filled gorges, rise from the water's edge to a height of between five and six thousand feet. The small hours of an extremely wet morning were spent on shore at Lyngseidet; while, by taking advantage of the fact that the boat calls twice at Skjervö, we were able to spend rather more than twelve hours upon that island, which lies just north of lat. 70°. On July 21st we left Tromsö in the 'Röst.' Next day we got two or three hours ashore at Stokmarknaes while stopping to coal. The Raftsund, grandest of the Lofoten straits, was traversed, and Svolvaer reached on the evening of the 22nd. Three days were spent in making excursions in the neighbourhood of Svolvaer, and we finally left for Trondhjem and Bergen on the 26th. Much time was lost in steamboat travelling, or the following list might have been somewhat extended.

Cyanecula suecica.—We met with the Red-spotted Bluethroat frequently in the willow swamps. Apart from the slight difference in plumage, it appeared to be the counterpart of the white-spotted form which I had met with on the Rhine, though, as the males had ceased singing, I had no opportunity of comparing the songs of the two species. The females showed themselves more freely than those of *C. wolff*, which, in my experience, are given to skulking. Skjervö appeared well suited to this species, as in moist hollows amongst willows and birches on the rocky slopes beyond the village we saw representatives of three pairs. On July 15th, in the Tromsdal, some distance below the Lapp encampment, a pair of Bluethroats scolded from willows by the stream. With them were the young ones, which had not long left the nest. They reminded one of young Stonechats or Robins, but were more richly coloured. On the 24th we saw a similar family amongst birch scrub a short distance inland from Svolvaer.

Ruticilla phoenicurus.—We only once identified the Redstart, in the lower part of the Tromsdal, to wit, on July 15th.

Erithacus rubecula.—The Robin seems to be a shy woodland bird in Norway. Several were singing at Lyngseidet about 1 a.m. on the 17th, as the dull morning light strengthened.

Saxicola oenanthe.—A pair of Wheatears, with their brood, on rough ground below the birch woods, were amongst the first birds that we saw at Tromsö. Two days later another pair upon the rocky shore of Grindö had young just flying. On July 23rd we met with this species on an islet off Store Molle, in the Lofotens.

Turdus iliacus.—Our first day at Tromsö, spent in the birch woods in pouring rain, introduced us to the Redwing's song of a few whistling or piping notes. Sometimes a young bird which had left the nest would bustle out of the top of a birch tree with a chuckle. The old birds which had young were exceedingly fussy. Thus on the 13th, in the woods at the base of Flöifjeld, a Redwing clucked and scolded persistently like a Song Thrush as it flew round us, but we could find nothing. A second pair, in a great state of excitement, led to a search, with the result that we put up some of their young ones just flying. Two or three Redwings were singing in the woods at Lyngseidet in heavy rain early on the morning of the 17th. Owing to its shyness, or to its habit of not breeding in colonies, this species appears to be far less numerous than the Fieldfare, but such can hardly be the case in reality, judging from the numbers which visit us in winter. While the Fieldfare sits boldly, the Redwing slips off its nest at the approach of an intruder; so that its eggs are not easily identified. A nest found on July 19th on the far side of the island was attributed to this species. The eggs, which were warm, were not to be distinguished with certainty from Fieldfares', but, though we watched for some time, no Fieldfare appeared to lay claim to them, while the Redwings were close at hand and vociferous.

T. pilaris.—We met with Fieldfares in every locality visited, even on Skjervö, where the birches were very small; but in Lofoten, where wood was scanty and of low growth, we only came across them upon one occasion. A first day in the woods at Tromsö, in steady rain, had yielded little, when the excited

scolding of a pair of Fieldfares called attention to their nest with three eggs, about seven feet from the ground against the trunk of a small birch. Several pairs were breeding in birches beside the track which led through the woods to Sandnaes, but in this and other cases the pairs were too few and too scattered to deserve the name of a colony. One bird was sitting upon three eggs, while two more were built into the bottom of the nest. Next day (July 13th), in the large woods at the base of Flöifjeld, we met with nests the contents of which varied from a single fresh egg to young birds which flew as we knocked the trunk of the tree. In one nest the four eggs were all above the usual size, one of them very decidedly so, measuring 1.35 by .95 in.; while the average dimensions, as given by Howard Saunders, are 1.2 by .85 in. But most of the nests were empty, probably in consequence of an earlier raid by collectors. Next day, upon Grindö, we found a nest with two fresh eggs. In the Tromsdal, on the 15th, leaving the track, which was thronged with tourists making for the Lapp encampment, we found a large colony of Fieldfares, but the birches were very awkward to climb, many of them being mere poles about thirty feet in height, and too slender to support a man's weight. On the 19th, on the far side of the island, nests still contained eggs or young in various stages of growth. Eggs from the same nest often showed very varied degrees of incubation, and sometimes no two young ones of a brood were of the same size. One nest was not more than 3 ft. 9 in. from the ground. Many birds, having finished breeding, were scattered over the clearings, feeding upon berries. On July 22nd, at Stokmarknaes, we climbed to many nests, but all were empty with the exception of a single one, which contained four well-fledged young. A few old birds were noisy, but many young ones were flying, and the breeding season was evidently over. I should much doubt whether in these latitudes the Fieldfare attempts two broods; it was difficult to form an opinion on the point at Tromsö, owing to the probability of the birds having been disturbed.

T. torquatus.—The Ring Ouzel was seen at Skjervö, about the high rocky part of the island, where, amongst crowberry and heather, Gulls were breeding. While waiting for a view of the midnight sun, we noticed that for about half an hour birds were

silent. Immediately after twelve the light improved, and the "tack tack" of a Ring Ouzel was heard. The influence of continuous daylight upon the routine of bird-life in the far north is worthy of further study. On July 25th we noted the Ring Ouzel on the top of a rocky bluff near Svolvær.

Phylloscopus trochilus.—We share Mr. Aplin's view as to the Willow Wren being the most numerous bird at Tromsø. In mid-July many pairs were feeding young which had just left the nest. But the song was to be heard daily all through the month, while in this country the bird is silent for about three weeks before recommencing with its quiet summer song early in August. Thus I noted that the Willow Wren was still singing at Svolvær on July 25th, and again at Bergen on the 30th.

Sylvia atricapilla.—On July 13th a Blackcap was singing in a sheltered gully on the lower slopes of Fløifjeld. Its presence seemed in keeping with the luxuriant vegetation of this favoured spot. Birch and mountain-ash hung from the steep banks of the little ravine, where water from the melting snow-patches above trickled over sheets of moss, amongst which grew *Parnassia*, *Geum rivale*, and quantities of that delicate and beautiful fern, *Cystopteris montana*. There were patches of a tall white-flowered umbellifer, and the rest was a rank jungle of meadow-sweet, wood-cranesbill, great valerian, and the blue alpine sow-thistle. The only sound beside the Blackcap's song was the note of a Northern Marsh Tit, which was busily investigating the rotten birch-stumps, some of which showed the marks of its bill. And all this in the latitude of Disco Island, and far north of Iceland! On the morning of the 17th I heard another Blackcap at Lyngseidet.

Parus borealis.—The Northern Marsh Tit was ranging the woods in family parties. The usual call is the familiar "chee chee chee" of our own bird, but on Grindö one puzzled me for a time by making use of a fresh note. In many places this species had been pecking and digging into the old birch-stumps.

Muscicapa atricapilla.—I saw a male Pied Flycatcher perched on a rail at Lyngseidet early on the morning of the 17th.

M. grisola.—Its note called my attention to a Spotted Flycatcher at the same time and place as the last. Lyngseidet would appear to be a favourite locality with the smaller birds.

Motacilla alba.—The White Wagtail was not very numerous at Tromsö, though on July 20th we noted eight roosting side by side on a sloop at anchor in the strait. There were several about the shore at Lyngseidet; two were seen at Skjervö, and one at Svolvaer.

M. borealis.—The Northern Yellow Wagtail was noted the day after our arrival, when one rose from the willow scrub by the shore of the strait near Storstennaes. Next day we saw several on Grindö. One much-excited pair led us to make a search, with the result that we caught a young one just able to fly, and saw another.

Anthus pratensis.—The satisfactory determination of Norwegian Pipits is well known to be a matter of no small difficulty. I examined some scores with the field-glass upon the bogs and crowberry "barrens" in the hope of detecting the Red-throated Pipit, but all appeared to be of the present species. Some Meadow Pipits were feeding young, but the majority had eggs, doubtless a second brood; and so numerous were they that in the Tromsdal we stumbled across three nests in the course of about half an hour. Upon Grindö a boy showed us a nest with six eggs in a clump of moss and *Empetrum*. We watched for the return of the bird, much bitten by Mosquitoes the while, and, though she did not turn out to be the wished-for Red-throated Pipit, it was interesting to note the artless and unconcerned manner in which the bird, under pretence of feeding, stole up to the nest.

A. obscurus rupestris.—The Norwegian Rock-Pipit cannot be numerous in the part of the Nordland which we visited, as, though constantly upon the look-out for it and frequently about rocky shores well suited to its requirements, I only met with it at Svolvaer.

Accentor modularis.—The Hedge-Sparrow seems to be a shy bird in Norway, keeping to the cover of birch and willow. One was singing at Lyngseidet on the morning of July 17th, and another the same day at Skjervö. A third, heard in Lofoten on the 25th, was also singing in an unfrequented spot far from the village.

Pyrrhula major.—On July 12th, a wet day spent in a first exploration of Tromsö Island, I twice heard the low piping note of this species as we pushed through the birch woods.

Linota linaria.—We never failed to meet with the Mealy Redpoll wherever there was birch or willow cover of any but the most stunted growth. The first nest found, on July 13th, was thickly and warmly lined with feathers (fowls') and willow down. It contained six eggs, which were incubated; but two others, found the same day, each contained three fresh eggs. Willows seemed to be preferred, and in some cases the nest was only three or four feet from the ground. On July 15th a crowd of tourists from the Hamburg-American liner 'Auguste Victoria' visited the Lapp encampment. In passing through the woods many of them brushed past, and must almost have touched, a Mealy Redpoll's nest, placed shoulder-high in a birch tree beside the track. The five eggs were warm, though the bird was not sitting. At Skjervö, on the 18th, there were many Redpolls about the village, pecking at dandelions, or perched on fences, fish-rails, or path. One or two of the cocks were brilliant little fellows, with blood-red forehead and crimson breast.

L. flavirostris.—On July 23rd, landing upon an island off Svolvear, we soon recognized Twites by their note. The locality seemed well suited to this moorland species, for, though there was only a scanty growth of heather, the peat soil was covered with berry-bearing plants—*Vaccinium myrtillus* and *uliginosum*, *Arctostaphylos alpina*, and, in wet spots, *Rubus chamæmorus*, yielding the luscious *möltebaer*.

Fringilla montifringilla.—At Tromsö one could not walk in any direction beyond the outskirts of the town without hearing the Brambling's drawling note. A nest found just after our first Fieldfares' on July 12th was some eight feet from the ground in the fork of a birch. It was an untidy nest, with Willow Grouse feathers worked into it. The bird fluttered off her four eggs, squealing and tumbling about. The cock bird then appeared; his note was a sharp "kip, kip," which, often heard subsequently, always reminded me of the Meadow-Pipit. Another nest, higher up than the first, was thick-walled and deep, made of moss, bents, and lichen, lined with hair and "rype" feathers. On the 15th the young had just left a nest near the Lapp camp, leaving an addled egg. Both the old birds were much excited. Our last nest, found on the 19th on the far side of the island, had small young ones and an egg, the latter probably hatching.

Passer domesticus.—As Mr. Aplin remarks, House Sparrows are scarce at Tromsö. On July 14th I noted one in the street. Three days later, as we touched at Havnaes on the Ulö, half a dozen Sparrows were chirping on the roof of a warehouse by the landing-stage, and next day we saw plenty at Skjervö. Both localities are farther north than Tromsö; so that the reason of their scarcity at the latter place does not appear.

Emberiza citrinella.—Several Yellow-hammers were singing at Lyngseidet as we landed, shortly after midnight on the morning of the 17th. On the 25th I saw one amongst the birches not far from Svolvaer.

E. schœniclus.—Young Reed-Buntings, not long out of the nest, were once or twice detected in hiding amongst the willow scrub. Thus, on the 15th, there were some just able to fly near the Lapp camp.

Plectrophanes nivalis.—On July 13th we ascended the Flöifjeld, a hill lying opposite to Tromsö just across the strait. It rises to a height of about 2500 ft. Above the zone of creeping birch we met with a great variety of small herbaceous plants of arctic and alpine type, including almost all the characteristic species of our Highland and Lake District summits. An Arctic Hare, in blue grey summer dress, was seen for a moment as it stole away, and amongst the grass were the runs and droppings of the Lemmings. After gaining the shoulder of the hill, our way led over bare stony tracts of *fjeld*, with a very gradual rise towards the summit. We had just passed a herd of about sixty Reindeer, when, as we came to a more broken rocky part of the slope, the Snow Bunting's call-note drew attention to a male bird of this species perched upon a boulder. We soon discovered that there were about two families of them,—the old cocks in full black and white livery, hen birds, and young ones which had not long left the nest. It has been remarked that, to one who has only known him in winter in the south, to come across the Snow Bunting in his summer quarters is like making the acquaintance of a new bird. Again, on July 25th, after a fatiguing ascent of one of the mountains near Svolvaer, under an almost tropical sun and through jungles of lady fern six feet in height, as we at length gained the ridge and rested on its northern side, where in the shade several large snow patches still lay unmelted, a twittered

call-note from the rocks below led to the identification of another pair of Snow Buntings.

Sturnus vulgaris.—At Lyngseidet, early in the morning of the 17th, several Starlings were passing to and fro, and just before we left Tromsö on the 21st, we noted a small party in trees close to the Museum.

Pica rustica.—Magpies were everywhere in evidence. They are more pert and familiar than with us. Thus at Lyngseidet, on the wet morning of the 17th, they were prying into fish-sheds, chattering on window-sills, gables, and church roof, tampering with the split Cod hung to dry on the fish-rails, and making mischief generally.

Corvus corax.—The Raven was seen so frequently that it must be a very common bird in the Nordland. It was often noted about the fishing villages as we came alongside in the coasting steamer. Four were seen near the top of Flöifjeld, and five came croaking overhead at Skjervö.

C. cornix.—The Hooded Crow was fairly numerous, and its large nests were sometimes seen in the birch woods. When the young had only recently flown, the old birds were very noisy, angry, and excited. At Skjervö there were Grey Crows about the houses and church.

Otocorys alpestris.—On July 14th, as we came down the Flöifjeld, I heard an unfamiliar note. The field-glass showed a pair of birds, which, from their black moustaches and the ear-tufts of the male, were identified in a moment as Shore Larks. They were very quiet, and gave no indication of having a nest. A pair of birds which puzzled us earlier in the day were no doubt of this species.

Dendrocopos minor.—Woodpeckers are scarce at Tromsö, and none were seen. But on July 19th I noticed a birch stump which had apparently been worked by this species, a Northern Marsh Tit having nested in the hole subsequently.

Cuculus canorus.—The Cuckoo, which at home had been silent for three weeks or more, was calling in the woods at Tromsö on the day of our arrival, July 12th. Another was heard at Lyngseidet as we landed soon after midnight on July 17th.

Falco æsalon.—Of the smaller birds of prey, the Merlin was the only one met with, but it appeared to be fairly numerous.

One passed over our boat off the southern end of Tromsö Island on the 14th. Three days later, when in the 'Lyngen' off Dybvik, one flew over, and we saw another early next morning at Skjervö. On the 24th, in a glen behind Svolvær above the head of the lake, we again heard the shrill note of the Merlin. There appeared to be a whole family of them amongst the birches which covered the lower slopes of the grey granite peaks.

Haliaeetus albicilla.—On July 19th we saw a White-tailed Eagle on the far side of Tromsö Island. It was mobbed by Gulls.

Lagopus albus.—A first meeting with the Willow-Grouse during a walk through the birch woods at Tromsö on July 12th served to remind us that we were in northern latitudes. The white wings and white-tipped tail render it a much more showy bird than our own. A pair fluttered up out of the willow-scrub, pitched again, ran with their heads down, and scuffled in great excitement, as six or eight "cheepers" got up one after another, flew weakly, and dropped again into cover. On the 19th, at the spot from which a pair rose, we found a young one with its leg broken. It had probably been attacked by a Gull. The same day, in coming down from the higher part of the island over a bank deep in crowberry, we put up another pair with about thirteen cheepers, some of which flew, while others skulked. Several old birds and another brood were seen on Skjervö. When there were young, the tumbling and fluttering performance always occurred. On the 25th we climbed one of the peaks in the neighbourhood of Svolvær. At about 1800 ft., while still struggling through the fern, something white appeared to fall from near our feet. It was a Willow Grouse tumbling down the hill-side. Two cheepers flew.

Numenius arquata.—The Curlew was sometimes heard about muddy or sandy shores, as at Lyngseidet on the 17th. On the 20th, when we landed on the large island of Kvalö, it appeared to be breeding on the moors in company with Golden Plover.

N. phaeopus.—We heard the Whimbrel's rippling note coming from the muddy shore at Lyngseidet, where it was feeding in company with Curlews and Oystercatchers.

Totanus calidris.—Redshanks seemed to prefer the far side of Tromsö Island, where they piped excitedly or ran amongst the

long grass just above the shore. One would sometimes perch on a tree. At Grindö, on the 14th, a boy gave us a "hard-sat" egg. On the 20th several were noisy about the Kvalö pools. I put up a young one just able to fly, and another swam out to avoid us.

T. hypoleucus.—The Common Sandpiper was seen on the stream in the Tromsdal above the Lapp encampment, and again on the 24th about the shores of the lake behind Svolvaer.

Tringa temmincki.—On July 20th we landed at Tisnaes, the point of the big island of Kvalö which is nearest to the southern end of Tromsö Island. Walking over the peat-bog where cloud-berry showed its ripening fruit, we roused a small wader, which flew round with a trilling note, then settled on a lump of peat. It was presently joined by the other one; no doubt they had young hidden somewhere close at hand.

T. striata.—A Purple Sandpiper was seen on July 23rd on the rocky shore of an islet off Store Molle in the Lofotens. It was excessively tame.

T. alpina.—The Dunlin was seen on the 20th on the Kvalö moors, and was from its manner evidently breeding

Phalaropus hyperboreus.—Walking over these moors, which strongly reminded me of Wales, we came to higher ground, and reached the series of small lakes of which we were in search. From a pool margined with sedge, a small wader got up and flew anxiously round, with a noise like "wick wick," then settled on the water. We watched both birds, one, probably the female, being rather the larger and brighter of the two. They swam high in the water, with the neck straight, head well up and nodding. Nothing of bird life in Norway pleased us more than this introduction to these trimly-built and confiding little waders. My friend half swam, half waded, out into the pool, and on a spongy islet found a slight hollow in the moss, the empty nest. We then in two places noticed something moving on the water as if a fly had fallen in. The glass showed that the appearance was due to a couple of nestling Phalaropes, which were swimming with scarcely more than their bills above water.

Charadrius pluvialis.—There were many pairs of Golden Plover about these barren uplands; in fact, I have never seen them so numerous on any moor.

Ægialitis hiaticula.—On July 14th a boy showed us a Ringed Plover's nest with four eggs on the shingle at Grindö. On the 20th there were several of these birds about the beach at Tisnaes.

Hematopus ostralegus.—Oystercatchers were very noisy about the rocky point at the north end of Grindö. They had made many nest hollows on the beach, which was here entirely composed of broken shell, with bits of coral and of calcareous sponges. On the 17th, near Lyngseidet, a vociferous pair must have had young ones hidden close at hand. Others were feeding with Curlew on the mud-flats. We saw Oystercatchers on the 23rd on a little island off Svolvær.

Sterna macrura.—On July 16th, just before the 'Lyngen' touched at Finkroken, on the Reinö, we passed a little island upon which a large colony of Arctic Terns was nesting. They filled the air like snowflakes. Others were seen on the 23rd during a boating excursion off Svolvær.

Larus marinus.—A few Great Black-backs were seen. On the 23rd I noted a pair about an *æg-vaer*, or Eider hatchery, off Svolvær.

L. fuscus.—A few Lesser Black-backed Gulls were breeding in company with the next species about the far side of Tromsö Island. The higher part of Skjervö Island, very rough ground, all crowberry and rock, was a gullery of these two species. Here on the 17th we caught three young birds of different ages, two of them nearly ready to fly. Others had already gone down to the beach.

L. argentatus.—Herring Gulls were very numerous on the 17th at Lyngseidet, where in the early morning they were pilfering split fish from the drying rails. The shore was littered with cod-heads and backbones, the usual refuse of a Norwegian fishing village. On the 18th we touched at the whaling station of Skaarö. Eleven freshly-killed Whales were floating at anchor alongside, two or three ashore were being flensed, and about a dozen carcasses which had been stripped were waiting to be made into fish-guano. The water was covered with oil and floating refuse, so that the place naturally had special attractions for Gulls, which were in countless numbers. At Tromsö we bought two Herring Gulls' eggs of the variety mentioned by Mr. Aplin. They are marked with red-brown and ash on a warm cream-

coloured ground. The locality given was Musvaer, behind Tromsö, and report said that in the whole colony, a large one, only one nest contains these red eggs each year.

L. canus.—The Common Gull appeared to be generally distributed, breeding upon the "egg-holms" in the sounds, about small pools upon the bogs, and on rocky islets in the lakes. Wherever we went, a few pairs cackled overhead. At Skjervö, on the 17th, I waded across the softest of spring bogs to a nest with three eggs. At the Kvalö pools several old birds were noisy overhead, and we saw two young ones swimming. On the lake behind Svolvaer two or three pairs had young ones just flying on July 24th.

Stercorarius crepidatus.—Richardson's Skua was frequently seen about the sounds and channels in the neighbourhood of Tromsö. At Grindö, on the 14th, I watched one amusing itself with a Common Gull, threatening it playfully. On July 20th, landing at Tisnaes on the Kvalö, and walking inland, we soon reached the moors already mentioned in connection with the Golden Plover. A Skua appeared on the wing some distance in front of us. Its long pinions and hawk-like flight reminded one of the Kite. It was evidently excited. After some search amongst the lichen and crowberry, my friend picked up a nestling Skua in dark smoky down, its quills and mottled scapulars just showing. The bird, first seen, which was of the lighter variety, tumbled about. It was soon joined by another, wholly dark. Both showed their flight to perfection, and were rather noisy. The young one was not in the nest, but the latter must have been close at hand. On the 23rd we noted a Skua of the light variety flying over one of the islets off Svolvaer. Another was chasing an Arctic Tern.

Alca torda.—At Tromsö, Razorbills were constantly on the move up and down the channel.

Uria grylle.—The same remark applies to the Black Guillemot. Several were noted on the 14th when we rowed to Grindö. On the 22nd, in the 'Röst,' we ran into the Trold Fjord, an inlet of the Raftsund, with grand surroundings. Here a few pairs of Black Guillemots were evidently breeding. Next day many were noticed in the course of a boating excursion to the islands off Svolvaer. Landing on a large rocky islet off Store Molle, we

scrambled along shore, and came to an inlet of blue-green water, framed by the scorched red granite rock, and with a dazzlingly white beach of broken shells and coral in places. The contrast of colours made a brilliant picture. Six or eight Black Guillemots were fishing, each one going off with its fish when caught to feed young. Others were certainly nesting on an islet upon which we were not allowed to land, as the wooden cross and watcher's hut proclaimed it an *æg-vaer*, or Eider hatchery. One of those seen was in the barred plumage; can it have been a last year's bird unusually late in assuming the adult dress?

Fratercula arctica.—Many Puffins were seen from the deck of the 'Lyngen' as we ran across from Kvitnaes on the Vannö to the mouth of Lyngen Fjord.

Colymbus arcticus.—We rarely met with a lake or pool of any size that had not a pair of Divers upon it, usually followed by their two young ones in the down. On the 14th we saw three settle upon the Praestvand, the lake in the woods behind Tromsö which supplies the town with water. At Skjervö they were constantly passing to and fro, uttering harsh cries while on the wing. As we watched the midnight sun a fine pair of Black-throated Divers with their young floated upon a pool just below us. Probably a dozen places were found where trampled water-weeds and pieces of egg-shell showed that young had been hatched. One pair had bred at the Kvalö pools. Others were seen near Svolvaer; one pair near Oos on the 25th had well-grown young.

C. septentrionalis.—The Red-throated Diver was not less numerous. Three were wailing in the inner bay as we landed at Skjervö on the 17th. As we came to one of the small sheets of water amongst the birch-clad hills, a pair were much excited, barking and rushing about the pool. We took this as an indication of eggs or young, but on returning an hour later the birds were gone. On the 19th we came across a string of lakelets in the woods towards the northern end of Tromsö Island. Upon the uppermost one floated a fine pair of Red-throated Divers amongst the flowers of the small yellow water-lily (*Nuphar pumilum*). They must have had young, as before taking flight they swam up to within twenty yards of us, and we could not but wonder how long they would survive if guilty of such temerity in less unsophisticated latitudes. A pair had a single young one at

the first of the Kvalö lakes; another pair had two young on the sedgy pool where the Red-necked Phalaropes were breeding.

Phalacrocorax carbo.—Cormorants were seen on July 23rd on the rocks and skerries off Svolvær.

Anser cinereus.—We did not actually meet with Grey-lag Geese, but, to judge from their droppings, they frequent the boggy margins of the forest pools on Tromsö Island. The pinioned Grey-lags in the courtyard of the Grand Hotel at Tromsö are said to have come from Karlsö.

Anas boschas.—One seen at a pool on Skjervö, another at the Kvalö lakes. A duckling which we caught on the 19th close to the water-lily pool above mentioned was probably of this species.

Somateria mollissima.—Eiders were common about Tromsö and the neighbouring islands, but we saw only ducks with their young broods; the drakes appear to prefer more open water. On July 14th there were many off Grindö. One party numbered five old birds and about twenty young; another duck had five, and yet another four under her charge. On the rocky point at the northern end of the island we found two young in the down washed up; they may have been killed by the big Gulls. A maternal Eider grumbled "og og" as a Great Black-back settled beside her brood. There was a nest in a hollow amongst the rocks with the down still in it; others amongst the rocky knolls, or just within the birch wood, had been cleared out, and were now mere hollows. A boy showed us a nest by the shore; the bird was sitting in a little stone shelter, from which she bustled clumsily out. There were only two eggs; one taken was on the point of hatching. On the morning of the 17th, as we walked to a rocky point near Lyngseidet, many Eiders swam out from the shore with their broods. It was very common to see two old ducks with five young ones between them: very many had none. Next day, at Skjervö, I noted two old birds followed by fifteen young ones, no doubt the produce of a couple of nests which had not been discovered; we found one such still full of down on the less frequented side of the island. At Svolvær semi-domesticated Eiders swam in the harbour amongst the boats, close under the hotel windows. When returning in the 'Sirius,' we lay to for some time at Kobberdal, on the island of Lökta, to take on board three hundred barrels of herrings. Close to us was a small islet

completely covered with huts for the Eiders to nest in; they were made of slabs neatly roofed with turf.

Mergus merganser.—At Grindö, on the 14th, we saw a female or young Goosander in the channel just off the southern point of the island.

M. serrator.—The Red-breasted Merganser appeared to be numerous. On the 14th there were several off the southern end of Grindö. At Lyngseidet, in the early morning of the 17th, as we rounded a rocky point, a female Merganser plumped off a rock into the water, while nine young ones tumbled over after her, showing white under sides and fluttering paddles for a moment as they wriggled off a flat stone into the water. The same day, at Skjervö, four females, immature birds, were at rest on a rock in the inner harbour, and a pair rose from one of the Diver-frequented pools. On the 23rd, as we were exploring an islet off Store Molle, three alighted on the water near us, and next day there was a party of four on the lake behind Svolvaer.

NOTES ON SHETLAND BIRDS.

BY F. S. GRAVES & P. RALFE.

THE following notes were made during a visit to the Shetlands from 20th May to 4th June, 1898, when the breeding season of most species in these islands is commencing. Three days at the beginning and end of the time were spent among the shores and islands about Scalloway, and two days in Unst. The remainder of the excursion included a day on Foula, a hurried run to Papa Stour, and several days in the Walls neighbourhood, with whose dreary heather-clad waste and countless lochs we became very familiar. The weather, though dry, was for the most part cold, with high wind, which prevented much boating, and confined us largely to the land.

WHEATEAR (*Saxicola oenanthe*).—Very common everywhere. This and the Skylark are the characteristic small birds. Several nests with eggs found.

WHITETHROAT (*Sylvia cinerea*).—On the rocky edges of the little landing creek on Foula were a few warblers of this species. They were very shy and silent, and must have felt sadly out of their element, as there are no bushes there.

WREN (*Troglodytes parvulus*).—A few seen.

MEADOW-PIBIT (*Anthus pratensis*).—On the moorlands; common.

ROCK-PIBIT (*A. obscurus*).—The "Bank Sparrow" was numerous on the Scalloway islands, where we found a sucked egg. Under a detached piece of rock on Foula was a nest with two eggs.

SWALLOW (*Hirundo rustica*).—On the 25th May we saw two on Foula, hawking along the little sheltered burn which falls into the creek forming the landing-place. On the 28th we saw two near the Loch of Cliff, Unst.

COMMON SPARROW (*Passer domesticus*).—Seen in the neighbourhood of houses and outbuildings.

TWITE (*Linota flavirostris*).—Frequent; principally on the coast.

CORN-BUNTING (*Emberiza miliaria*).—About Walls and Balta-sound, in the neighbourhood of cultivation.

SKY-LARK (*Alauda arvensis*).—Very numerous. The exquisite song, poured out amidst the high cold wind, enlivened the dreariest heaths of the country between Walls and Sandness. A nest with three eggs among the heather.

STARLING (*Sturnus vulgaris*).—Numerous on Foula and elsewhere. We found them nesting in a variety of situations, as below the eaves of a stable, on sloping ground between two boulders on one of the islands near Scalloway; and in Unst, in the loose stone base of a low sod fence within a few inches of a little stream. They seem to place their nests anywhere within shelter.

HOODED CROW (*Corvus cornix*).—Common. There was an occupied nest on the bell-gablet of the Wesleyan Church at Walls.

RAVEN (*C. corax*).—One on Foula, buffeted by an Oystercatcher. Two between Walls and Lerwick.

SHORT-EARED OWL (*Asio accipitrinus*).—One among the rocks near Braga Ness, Walls, persecuted by Hooded Crows.

KESTREL (*Falco tinnunculus*).—One seen in Unst.

CORMORANT (*Phalacrocorax carbo*).—Saw some birds, but no breeding place.

SHAG (*P. graculus*).—Common. Owing to the rough weather we visited no nesting place.

GANNET (*Sula bassana*).—A few seen off the coast.

MALLARD (*Anas boscas*).—Met with nesting both in Mainland and Unst, some of the nests being hidden in tall heather. In three cases the duck was sitting on nine eggs.

TEAL (*Querquedula crecca*).—Two on one of the Walls lochs.

WIGEON (*Mareca penelope*).—Two drakes on Hulma Water, 21st May.

GOLDENEYE (*Clangula glaucion*).—Two on a small lake near Walls; others noted in Unst.

EIDER DUCK (*Somateria mollissima*).—Nesting on the islands near Scalloway. In two cases where there were three fresh eggs the nests were lined with down. Abundant off Papa Stour; we saw, as mentioned by Mr. Raeburn, birds among the Great Black-backed Gulls on Lyra Skerry.

ROCK-DOVE (*Columba livia*). — Seen everywhere on rocky coasts. In a cave on Fore Holm, F. S. Graves, with great difficulty, reached a nest in which were two hard-sat eggs. Close to this was another with newly-hatched young (31st May).

CORN-CRAKE (*Crex pratensis*).—Five eggs taken on Foula in 1897 were shown us.

GOLDEN PLOVER (*Charadrius pluvialis*).—Only a few pairs seen, near Walls and in Unst; evidently nesting.

RINGED PLOVER (*Ægialitis hiaticula*).—Very common on holms and stony barrens; sometimes also on loch-sides inland. Abundant in the interior of Papa Stour, where the surface has been stripped of sods, leaving a waste of sharp-edged red and white shingle, with scraps of sickly vegetation. Nests found on the Scalloway islands. One on Hildasay was formed of the dry droppings of rabbits arranged in a well-shaped ring round the four eggs.

LAPWING (*Vanellus cristatus*).—A few here and there. Evidently breeding near Whiteness and Walls.

OYSTERCATCHER (*Hæmatopus ostralegus*). — Common everywhere on the coast. Nesting abundantly on the Scalloway islands. One nest contained four eggs. We saw the birds buffet the Raven and Hooded Crow.

COMMON SNIPE (*Gallinago cœlestis*).—We saw one pair at Snarravoe, Unst.

DUNLIN (*Tringa alpina*).—A few pairs seen by grassy loch-sides. We repeatedly heard their reeling "song," which was uttered when the bird was standing on a tussock, and not when on the wing. They were very tame. At one of the places they frequented were several small cup-shaped nests on the tufts of grass, but laying seemed not to have commenced.

COMMON SANDPIPER (*Totanus hypoleucus*).—Two pairs met with near Walls on inland lochs.

WHIMBREL (*Numenius phæopus*).—Heard the characteristic cry from the steamer while in Bastavoe, Yell.

CURLEW (*N. arquata*).—A few only seen, both on the moors and coast. One apparently breeding on Hermanness, Unst.

ARCTIC TERN (*Sterna macrura*).—Noticed none on our first visit to Scalloway islands (20th May); on second visit (31st May) they were numerous at their well-known stations, and noisy, although no vestiges of nesting were yet to be seen.

BLACK-HEADED GULL (*Larus ridibundus*).—Seen at two places; a few perhaps breeding on the shore of a voe near Weisdale. There is a colony on a rocky knoll in the middle of a loch in another neighbourhood. This little island has steeper sides than is usual, and a luxuriant growth of *Luzula*. On 21st May there were about twelve nests, empty, or with one, two, or three eggs. The eggs in each nest agreed in colour.

COMMON GULL (*L. canus*).—Common, and nesting in many places, on the low rocky brows of the Scalloway islands, in swampy lowlands near Whiteness, and at the tide-edges at Littlure, near Walls. Most of the lakes of the Walls district had a few pairs, the characteristic sites for the nests being little knobs of rock or boulders rising a foot or two above the water-level, with a hollow on the top just large enough to accommodate a single nest. Few of these by the end of May contained their full complement of eggs. In a little shallow pond on the Chingies, Scalloway, were nests similarly placed. The cry of the Common Gull, a kind of harsh croak, is very characteristic.

HERRING GULL (*L. argentatus*).—Common on the coast; we did not observe it nesting inland. Innumerable Herring Gulls, however, were resting on the Loch of Cliff. Opposite the Rusna Stacks, Walls, we saw nests with eggs on 23rd May; at the end of the month others on the islands at Scalloway had also their complement.

LESSER BLACK-BACKED GULL (*L. fuscus*).—Common. A few pairs nesting on Hildasay, both on a loch which that small island contains and on its coast; others on the cliffs near Walls. In many of the lakes of the Walls district are islands on which this species was gathered, sometimes in large numbers, for nesting purposes. These islands had lost the ling which carpeted the lake-sides and other islets, and were richly verdant, and in some cases delightfully adorned by flowering marsh-marigolds, at this season almost the only conspicuous wild flower of Shetland. (On verdure produced by Gulls, see Mitchell, 'Birds of Lancashire,' p. 253, second edition.) On one or two of these spots which we visited on 23rd May nesting operations had only just commenced; we saw no eggs during our stay.

GREAT BLACK-BACKED GULL (*L. marinus*).—Odd pairs breeding on some of the Scalloway islands. We saw (across a chasm)

the colony of Lyra Skerry, described by Mr. Raeburn (Zool. 1891, p. 131), and great numbers of the birds, mixed with other species, were assembled on the shallow ponds in the interior of Papa. The darker colour of the mantle, as compared with that of *L. fuscus*, was very noticeable. We were shown some eggs, taken recently (25th May) on Foula, where, we were told, the bird is rather scarce.

KITTIWAKE (*Rissa tridactyla*).—Common. There are great colonies, as is well known, on Foula, and in Burra Firth, Unst. On the former island we saw innumerable Kittiwakes flying from a bit of wet ground inland to the cliffs, each with a morsel of moss in its beak.

GREAT SKUA (*Stercorarius catarrhactes*).—We saw the colonies both on Foula, and, by permission of Mr. Edmondston, on Hermanness. At the former laying had just commenced. On 25th May we saw a number of empty nests, others with one egg, and about twelve with their full number of two eggs. The nest was usually a scratched hollow about a foot across.

RICHARDSON'S SKUA (*S. crepidatus*).—Saw them nesting on Hermanness and Foula, on the latter in two places, near the Great Skua, and, in larger numbers, on the level not far from the landing place. On 25th May, on Foula, we saw one egg only, where a very large number of Skuas was collected; yet we were several times actually struck by the birds, which never occurred with the larger species, nor indeed with this species on Hermanness, where in a few cases two eggs had been laid on 28th May. In both colonies dark-plumaged birds seemed to be in the majority.

RAZORBILL (*Alca torda*). GUILLEMOT (*Uria troile*).—Abundant on the sea; we saw little or nothing of their breeding.

BLACK GUILLEMOT (*Uria grylle*).—Very common and abundant; quite the characteristic sea-bird of Shetland. Laying scarcely commenced by the beginning of June.

LITTLE AUK (*Mergulus alle*).—On the top of the brow near the Kaim, Foula, we picked up a part of a skeleton with the wings attached.

PUFFIN (*Fratercula arctica*).—Numerous; nesting abundantly on Foula; eggs seen. One we picked up had been carried some distance inland, no doubt by a Raven or Crow; it was undamaged except by a small dent, probably caused by the bird's bill.

RED-THROATED DIVER (*Colymbus septentrionalis*).—A pair on a small loch near Walls, 21st May. We afterwards probably saw one of the same birds, flying overhead with outstretched neck, and uttering its strange unearthly cry. These were the only Divers seen, except a single bird on the sea near Yell, which was perhaps *C. glacialis*.

STORM PETREL (*Procellaria pelagica*).—Their nesting-holes were shown on an island near Scalloway. We saw also some eggs taken in 1897 at Brindister.

MANX SHEARWATER (*Puffinus anglorum*).—We saw, on Foula, an unblown egg which had been taken on 18th May.

FULMAR (*Fulmarus glacialis*).—Multitudes on certain parts of the Foula cliffs, as at the Kaim and Smalie. They had just begun to lay; we saw an unblown egg taken about 25th May. The increase of this species, which established itself on Foula some time between 1870 and 1880, is very remarkable.

NOTES AND QUERIES.

MAMMALIA.

CARNIVORA.

Cats in London.—The number of Cats in London, and their depredations on wild birds in our parks, having been variously estimated, I applied for information to the manageress of the "London Institution for Lost and Starving Cats," who has obliged me with the following communication.—ED.

"I have much pleasure in replying to your letter, and in giving you the information you require. According to Mr. Hudson's book, 'Birds of London,' the number of Cats in our great metropolis cannot be less than three-quarters of a million, and the stray and starving ones certainly not under 80,000 to 100,000. The number of Cats we have taken in during the three years from the 22nd January, 1896, to 22nd January, 1899, is exactly 13,994. The first year we received 2450, the second year 4010, and this third year 7527, making a total of 13,994 Cats. We could increase the number tenfold but for want of means, and, in consequence, want of hands and premises. Depôts ought to be established in every part of London, with one headquarter to take the Cats collected daily at these various stations. Also a tax ought to be levied on Cats, so as to decrease the shocking number of stray and starving Cats which now infest our streets, and thereby lessen the abominable cruelties to which they are exposed. We are only in our infancy as yet, but I hope, with energy and push, we shall in a few years' time establish an institution on similar lines to the Battersea Dogs' Home, with the exception that we search for Cats in every available corner, and call for them at people's request free, but with the prayer for a little help. I should think the probable number of Cats in London could be easily estimated. There are few houses which do not shelter at least one Cat, and every tenement has, with few exceptions, one. Cats have on an average three litters a year of at least three kittens at a time, and the Cats breed at six months old. A Cat's age ought to extend to about ten years, but this is only when they have good homes and are taken in at night. Cats exposed to all the hardships of weather hardly live beyond five years, and stray Cats very few months after they are deserted. We have received Cats in one or two instances twenty-two years of age, and several over eighteen. These of course were great pets, with

every care lavished on them. A Cat is a delicate animal, with innumerable ailments. It easily becomes ill. It is a cowardly animal—if I may so express myself—and allows itself to die by not struggling against its malady, though at the end it dies hard. When a Cat gets a cold, or pleurisy, or distemper, it loses, through its nose being ‘bunged up,’ all taste and sense of smell. The moment it cannot *smell* its *food* it will not touch it, and dies of starvation even with a dish of food alongside it. Therefore a Cat, when ill, must at once be forcibly fed, or it will let itself die. Every one of these 13,994 Cats have passed through my hands, therefore I ought to know something about them.”

Polecats in Wales.—Last November I had two of these animals (*Mustela putorius*) sent to me from a certain district in Cardiganshire, where they are not so uncommon as is supposed. They were both males, and in excellent pelt. The larger of the two is a beauty, his total length 23 in., length of tail 7 in., weight 2 lb. 3 oz. The fur is of great length and thickness.—OXLEY GRABHAM (Heworth, York).

White Stoat.—Although the winter has been so mild, I procured, during the last week in December, the whitest Stoat (*Mustela erminea*) that I have in my collection; barring the black tip to the tail and a few brown hairs round each eye, it is pure white. Its dimensions were—total length, 12½ in.; length of tail, 3¼ in.; weight, 6¼ oz.; female. As will be noticed, the tail is very short, and the black tip only measured half an inch. Now, in my small series of skins, this is the second short-tailed Stoat that I have procured. The assumption would be that they had met with some accident, and part of the member was missing; but they were both skinned by myself. The tail tapered off to a fine point as in normal specimens, and there was nothing to indicate that any injury had been received. I should mention that the other of these short-tailed Stoats is a male. A friend of mine has a theory that these white Stoats are in several ways different to the common form—more slender in make, fur more silky, &c.—but in this I cannot agree with him. Certain it is, however, that they differ *inter se* very considerably in the length of their tails, and in the size of the black tip at the end.—OXLEY GRABHAM (Heworth, York).

AVES.

Great Grey Shrike in Warwickshire.—A specimen of *Lanius excubitor* was taken by a birdcatcher at Harbury Spoil Banks, near Leamington, on Dec. 27th, 1898. It was caught on the bird-lime, having made a dash at the stuffed decoy Goldfinches fixed upon a bush. Evidently a young bird of the year, as I noticed the markings on the edges of the breast feathers were very distinct. When I saw the bird a fortnight after it had been

taken it had become comparatively tame and accustomed to confinement.—
J. STEELE-ELLIOTT (Clent, Worcestershire).

Great Grey Shrike at Scarborough.—On Dec. 30th a Great Grey Shrike (*Lanius excubitor*) was killed on the shore a little to the north of Scarborough. The bird had apparently just arrived, and was making its way towards the cliff when first noticed.—W. J. CLARKE (44, Huntriss Row, Scarborough).

Strange Nest of a South African Bush Shrike.—I found a nest of the Pied Bush Shrike (*Bradyornis silens*) near the Fountains, Pretoria, Transvaal, on Nov. 6th, 1898. The nest was about eight feet from the ground, in the fork of the stem of a small thorn tree. It was built purely of *twine*. I examined it carefully, but could not find any other material used in its construction. The inside was lined with small white feathers. It contained three eggs of a pale green colour, splashed with red at the larger ends.—ALEX. ROSS (Johannesburg, Transvaal).

[Fountain Grove is a short distance from Pretoria, and is a favourite resort. There is a hostelry there, many picnics held, and many corks drawn. Hence the *twine*.—ED.]

Scoters in Hants and Isle of Wight.—Mr. Percival-Westell's note on these birds (*Edemia nigra*), appearing in your last December number (p. 505), rather puzzles me. Knowing the localities mentioned well for a number of years, I have found the provincial name of "Isle of Wight Parsons" applied to *Cormorants*, and though frequently having met with Scoters, their flight has been of such a character that a description of them as "lazily winging their way" would require some qualification. Since 1866 I could number the instances of having met with them on my fingers, but *out* of the breeding season they are met with frequently by the shore boatmen, who usually describe them to me as "some of them 'ere Scouter Ducks." In November last year I had one close to me diving amongst the rocks between Bonchurch and Shanklin, and a party of five flew by me out by the wreck of the 'Eurydice' in March, 1878. However plentiful Scoters may be, they are not generally known as "Isle of Wight Parsons," nor do they breed there.—H. MARMADUKE LANGDALE (The Vicarage, Compton, Petersfield).

Scoters in South Hants ?—When I wrote that the Scoter (*Edemia nigra*) was called the "Isle of Wight Parson" (Zool. 1898, p. 505), I was fully aware that the common Cormorant was subject to the same appellation, and I should have stated this in the first instance. In spite of Mr. A. G. Headley's assertions, I still adhere to the fact that I saw the common Black Scoter every day during my fourteen days' vacation in the

county in the middle of August last, either at Hayling Island, the Isle of Wight, or flying across the sea from one to the other; and that the drum-major at Eastney Barracks told me that they could *always* be seen *all* the year round. When I pointed one out to him, not twenty yards distant, he remarked, "We call those Isle of Wight Parsons"; and others confirmed this statement. I am a young ornithologist, and only too pleased to be corrected in any statements I may make, and I am much indebted to Mr. Headley for pointing out the error I made in regard to the Scoter's flight. Those I saw did fly *rapidly*, and it was a grave slip on my part to say they *lazily* winged their way. The word *regularly* should have been substituted for *lazily*. — W. PERCIVAL-WESTELL (5, Glenferrie Road, St. Albans).

Late Stay of Land-Rail.—On Dec. 3rd I had a freshly-killed specimen of the Land-Rail (*Crex pratensis*) brought to me. On dissection it proved to be a female, and showed no signs of having suffered any injury which might have prevented it migrating at the usual time.—W. J. CLARKE (44, Huntriss Row, Scarborough).

Nesting Habits of the Moorhen (Zool. Dec. 1898, p. 506; *ante*, p. 30). —We are well aware that birds differ somewhat in their habits in different localities, but this is often an adaptation to surroundings. My experience with regard to the species in question (*Gallinula chloropus*) is that it seldom, if ever, covers its eggs on leaving the nest, at least in this neighbourhood. In my birdsnesting days I have seen many nests and eggs of the bird, as I sometimes had the privilege of boating upon some three or four miles of the river Avon, which, being strictly "preserved," was a fine nursery for the reed-loving species, and I do not recollect ever finding a nest in which the eggs were even partially covered, except perhaps where the parent bird, alarmed at my near approach, had scuttled off, and in her haste had drawn a promiscuous reed across her eggs, with no attempt at concealment; indeed, the *number* of eggs in the nest was often discovered before a very near approach, and this notwithstanding the approximate hue of the ground colour of the eggs and the reeds of which the nest was made; it often seemed to me the similarity in colour of nest and eggs were protective items not to be overlooked. On one occasion, in particular, I remember finding a large branch of a tree which, during the winter flood, had been washed down and stranded in the very midst of a shallow and lagoon-like part of the river; on a projecting portion of this branch, standing up some two feet out of the water, the decaying reeds, &c., had accumulated, and on the top of it was a Moorhen's nest quite exposed, and the eggs were easily detected at a distance, as on account of the shallowness of the water at the time it was with difficulty the punt could be got to the spot; and I may

here remark that, although the river was unusually wide at this particular place, yet within two hundred yards of the site of the nest a wood came down almost to the water's edge, the higher trees of which were occupied by a "Rookery," which one would think would have been an inducement for the Moorhen to use every precaution to protect her home; so unlike the habits of the Little Grebe, the eggs of which are invariably covered more or less. It always seemed a mystery to me how the latter bird managed to cover up her eggs so adroitly, and, greater mystery still, how she managed to hatch them in such a situation. With regard to the nidification of the Moorhen, I have often found that a much larger number of nests seem to be constructed than are ever used; but for what purpose is this apparent waste of time and labour? We are well aware the same thing occurs with other species—the Lapwing, for instance; possibly some annoyance or unsuitable site is discovered after the work is begun, but in many instances another nest is made in close proximity to the one deserted. I have not found a large amount of variation in the eggs of this species, but on one occasion I discovered a nest containing three eggs which differed somewhat from the normal type, in that the larger end was much darker than the other portions of the shell, which was almost spotless except upon this darker zone.—G. B. CORBIN (Ringwood, Hants).

With reference to Mr. W. Hewitt's interesting note on this subject (Zool. 1898, p. 506), may I be permitted to give the results of my small experience? I have never found nests of the Moorhen with the eggs covered over, neither when the first egg only has been laid, nor when the clutch has been complete. Only last year (1898), I examined, in this neighbourhood, more than a dozen nests of the Moorhen, and not one of them had the eggs covered over in any way. It is a well-known fact, however, that the Little Grebe, or Dabchick, invariably covers its eggs over on leaving the nest. With regard to Mr. Hewitt's suggestion as to the local variations in the habits of birds, I may say that what Moorhens' nests I have found in other parts of the country—*e. g.* Essex, Middlesex, Surrey, Herts, Hants, and Suffolk—have never had the eggs covered over.—BASIL W. MARTIN (Darley Abbey, Derby).

With reference to Moorhens covering their eggs, I have one record of a bird of this species doing so, or partly doing so, after her full clutch was laid. This was near here, on May 21st, 1894, when a Moorhen I disturbed off her nest containing nine eggs, partly covered them with pieces of seaweed and a fresh green leaf or two. She had then laid her full clutch, but was only just beginning to sit, as the eggs were fresh. On July 19th of that year I found, close to the same spot and probably belonging to the same pair of birds, one Moorhen's egg lying on the bare ground, with a few bits of reed placed round it; on visiting the spot a few days later there were

four eggs in quite a respectable nest, as good as these birds usually make on land. On neither of these two latter occasions was there any attempt to cover the eggs.—A. BANKES (Beaulieu, Hants).

A Habit of the Roseate Tern.—I think it is not generally known amongst students of birds that it is alleged (and I have great faith in the allegation) that the Roseate Tern (*Sterna dougalli*) robs the commoner and allied species with which it associates, of its food, after the manner of the Skuas. Some time ago I asked a friend, although not a professed ornithologist, but who had lived near a colony of Roseate Terns for two or three summers, and had constant opportunities of observing the birds, to give me a few particulars of the habits of this species, and he told me as a positive fact that he had seen the Roseate Tern rob the other Terns of their food, "not once or twice, but hundreds of times," generally whilst on the wing; but he has also seen them take food from the young of the Arctic Tern, with which their parents had just provided them. In fact my correspondent says:—"They fly a great deal swifter than the Common or Arctic Tern. They very seldom fish for themselves; if they see a Common or Arctic Tern with a fish in their bills, they pounce upon it just the same as a Hawk will upon a small bird, and take the fish clean out of their bills; they are very quick. I have even seen them take a fish out of a young Tern's bill that has been in the nest. I can tell a Roseate Tern amongst a thousand Common Terns. When they are flying they seem to be longer in the body and longer in the wings than any other Tern, and they have a very hoarse cry, quite different to any other Tern's. I have never seen three Roseate Tern's eggs in one nest, nor even heard of their laying three eggs." I visited the locality last season, but the majority of the birds had not commenced to lay their eggs, being unusually late in that respect. I did not actually see any Roseate Tern take food from the commoner species, although I watched several of the birds circling and wheeling about for minutes together. This may be accounted for by the fact that they were not busy with nesting operations, and that this robbery is practised much more when the eggs are hatched, even if they do not then obtain all their food in that manner. Whilst in the district I made all enquiries I could respecting this alleged habit of the Roseates, and could get nothing but corroboration, sometimes even without seeking it. One of the local names for this bird is the "Rosette" Tern, probably only a corruption or a misunderstanding of the word "Roseate," and sometimes it is called the "Rosy" Tern; but another local name used more among the natives who know the species is the "pirate" bird, from its habit of robbing the other Sea-swallows. One man with whom I am acquainted, and who has lived near this habitat of the Roseate Terns for eight years, told me he was certain he had seen these birds snatch food from the other Terns very

frequently, but said it was chiefly done when they had young to feed. I do not know anyone who has had such opportunities of observing this species as my informant, or who is better acquainted with the bird or its habits in the summer season. I also questioned one of the oldest inhabitants—a sea-faring man—who I have no doubt has been in the nesting locality of these birds more often than any other living man, and he is convinced the Roseate Tern does rob the other Terns of the small fish they carry in their bills from the sea. Several other men likely to know told me the same. Another striking piece of evidence is as follows:—Whilst I was watching a man repairing a small steam yacht, he remarked to me, “Well, have you been to see the pirates to-day?” That was just after my first visit to the colony in company with the owner of the above mentioned yacht, and it was the first time I had heard the birds spoken of as “pirates.” The term had to be explained somewhat before I really understood what was meant. I shall be glad to learn whether any reader can confirm or refute this allegation.—E. G. POTTER (14, Bootham Crescent, York).

Iceland Gull at Scarborough.—On Jan. 1st, while fishing from the rocks in the North Bay, I noticed a Gull fly past which I took to be *Larus leucopterus* from its small size and the absence of black on the primaries. A gunner not very far from me shot down the bird as it passed over him, and brought it to me. It was, as I had imagined, an Iceland Gull in the cream-coloured plumage, with the back inclined for slate-grey, which immediately precedes maturity. The tip of the lower mandible was missing, having apparently been carried away on some previous occasion by a shot. The bird had, however, not suffered by the injury, and was in excellent condition. The stomach was empty. I have only noticed this Gull on two previous occasions at Scarborough.—W. J. CLARKE (44, Huntriss Row, Scarborough).

Birds in Kensington Gardens, 1897–1898.—The gradual extermination of most species of birds in London makes it interesting to put on record from time to time those which still exist there, or are to be seen on migration. Mr. Yarrell has somewhere mentioned that in his day seventy-two species frequented Kensington Gardens. During the past two years I have kept a careful note of all the birds which I have happened to see in the Gardens. These I find amount to twenty-seven species. Of these, fourteen species still regularly breed there. The remainder are visitors, some appearing only at the season of migration, but with annual regularity. I have no doubt that more constant or regular observers might contribute to swell the list of visitors, but I have limited my catalogue strictly to birds which I have myself seen, only in Kensington Gardens, and clearly identi-

fied. Perhaps some other readers of 'The Zoologist' will send additions to the list.

Song-Thrush (*Turdus musicus*).—Resident and fairly plentiful, but decreasing gradually.

Blackbird (*T. merula*).—Resident, but somewhat less plentiful than the last.

Robin (*Erithacus rubecula*).—Resident and common.

Hedge-Sparrow (*Accentor modularis*).—A few pairs still resident.

Willow-Warbler (*Phylloscopus trochilus*).—Very regular visitor on migration, and may be heard daily at the end of April.

Great Tit (*Parus major*).—Several pairs still resident, but decreasing.

Blue Tit (*P. cæruleus*).—Resident, and the most abundant of the *Paridæ*.

Coal-Tit (*P. ater*).—Now only a visitor, I think.

Marsh-Tit (*P. palustris*).—A rare visitor. One specimen used to haunt the flower-walk in November, 1898, but, from its plumage, seemed fresh from the country.

Wren (*Troglodytes parvulus*).—Not uncommon; resident.

Starling (*Sturnus vulgaris*).—Abundant and resident. Nests in the hollow trees and buildings round the gardens.

Jackdaw (*Corvus monedula*).—A few pairs frequent the gardens, and nest in the old trees near the Broad Walk.

Carriion-Crow (*C. corone*).—A pair (and sometimes two pairs, I think) nest regularly near Speke's obelisk. In the winter I have seen parties of four or five in the morning before the gardens are disturbed.

Rook (*C. frugilegus*).—Only a visitor since 1893, when for the last time twelve nests were occupied at the north end of the Broad Walk. A few Rooks visit the gardens daily, and on Feb. 2nd, 1898, a pair began a nest in an elm on Palace Green, but soon gave up the work.

Spotted Flycatcher (*Muscicapa grisola*).—Still a regular summer visitor, and very interesting as the only summer migrant which still remains to nest. For the last two years a pair (and, I fear, the last) have had a nest somewhere near the Albert Memorial and Rotten Row.

Swallow (*Hirundo rustica*).—A regular and very common visitor on migration.

Martin (*H. urbica*).—A much less common visitor on migration.

Sand Martin (*Cotile riparia*).—Rare; but, I think, comes regularly every spring.

House-Sparrow (*Passer domesticus*).—Very abundant, and probably increasing. In these mild winters I have seen London Sparrows busy nesting on Jan. 25th. Partial albinos seem increasing in numbers.

Chaffinch (*Fringilla cælebs*).—Not long ago was resident, but now, I think, only an occasional visitor.

Pied Wagtail (*Motacilla lugubris*).—Fairly regular visitor on migration, but only in the early morning. I have seen them in March and December, 1898.

Yellow Wagtail (*M. raii*).—Very rare on migration. I saw a party of five near the round pond early on April 27th, 1898, but they had departed by 8 a.m.

Swift (*Cypselus apus*).—Rare visitor on migration. I saw four hawking over the pond on the afternoon of Aug. 8th, 1898, when the gardens were crowded with people.

Tawny Owl (*Syrnium aluco*).—A pair, I think, of genuine wild birds used to inhabit a hollow tree near the orangery, and hoot loudly at night. They disappeared in the spring of 1897, and I have heard none since.

Wood-Pigeon (*Columba palumbus*).—Abundant and fearless. A few pairs remain all the year, but most depart in winter. They are early breeders, and I noticed them in pairs and cooing loudly in January.

Moorhen (*Gallinula chloropus*).—Resident and nests at the Serpentine. I have seen sometimes half a dozen together, but often all disappear for a time, and, I suppose, visit the other London lakes.

Black-headed Gull (*Larus ridibundus*).—A winter visitor from October (or earlier) to April. Large parties often make their way from the Thames, but seldom stay long about the pond. Most of them are birds in immature plumage and very fearless.—HAROLD RUSSELL (Kensington Palace).

Fecundity in Birds.—I have to thank Mr. Storrs Fox for his kindly notice of this subject (*ante*, p. 23). Perhaps he will excuse me if I in turn touch upon one or two points he brings forward. He says, "Birds cannot be *conscious* weeks beforehand that the time for their departure is drawing near." If Mr. Fox was in the habit of keeping caged birds he would realize, I think, that a Nightingale, for instance, feels the approach of the period of migration weeks in advance; it is vaguely restless and unsettled. That it argues logically from this feeling of unrest, I could not venture to infer: what I believe is, that the bird is influenced so that it cannot quietly attempt to nest again. I have found in the case of both winter and summer visitors, that the migratory instinct begins to work upon the bird a month or more before it actually leaves. My caged Bramblings, to give a second example, begin to fret before February is out. Mr. Fox extends my suggestion, "a hen of small size could not well lay more than five eggs," from the Finches and Warblers to the Tits. Again I was relying on cage-bird experiences. I have frequently stimulated Finches to lay more than five eggs, with the result that I have subsequently lost the hen: I have had fourteen eggs from a hen Bullfinch in about five weeks, after which she has died. From a foreign bird, neither Finch nor Warbler, I have had forty and fifty eggs in a season with no apparent resulting injury to the parents.

What I said is, I think, true of Finches, but it can only be extended to other genera with care. Mr. Fox will, I hope, see in another article some notes I had prepared on the other subject he mentions towards the conclusion of his paper, for the kindly criticism of which I am very grateful.—BASIL DAVIES (Lincoln College, Oxford).

AMPHIBIA.

Toad in Nest of Titlark.—On the 14th June last year, when exploring some sandhills in the island of Vlieland, in North Holland, I put a Titlark (*Anthus pratensis*) off her nest, and, on examination, found it contained three eggs, and also what at a first glance I took to be a young bird, and, from its size, perhaps a Cuckoo. On stooping down to examine it closely, I discovered that it was a Toad, and that the bird's eggs were lying on its back. The Toad, on being touched, slowly and deliberately crawled out of the nest, the eggs slipping off its back into the hollow below, and began to bury itself in the sand outside. Inside the nest was an inner rim or ledge, which, from its appearance, looked as if the Toad had rested there some time. Curious to know the effect produced on the eggs, which formed the middle part of this strange sandwich, lying between the breast of a warm-blooded bird and the back of a cold-blooded reptile, I broke one of them, and found it nearly fully incubated and healthy. The Toad was a Natterjack (*Bufo calamita*).—W. H. M. DUTHIE (Row, Doune, Perthshire).

PALÆONTOLOGY.

A Monstrous Dinosaur.—Assistant-Professor W. H. Reed, of the Geological University of Wyoming, has made a great discovery by unearthing the petrified bones of the most colossal animal ever taken from the earth's crust. This fossil monster was a dweller in the Jurassic age, a Dinosaur, measuring nearly 130 ft. in length, and being perhaps 35 ft. in height at the hips and 25 ft. at the shoulders—an animal so terrible in size that its petrified skeleton alone is believed to weigh more than 40,000 pounds. Prof. Reed made the great find last August while prospecting for fossils ninety miles north-west of Laramie, and during the time which has elapsed since then the members of the University have been secretly at work in its restoration. The skeleton of the animal is so vast that its smallest bone yet found is more than a man can lift, and, with two men constantly at work, it is believed that many months will be required before the monster can be placed on the campus at Laramie. Although its restoration is as yet incomplete, still enough of its bones have been disinterred to establish its zoological position, and to place it in geological history as the king of all animals restored from fossil fields. In comparison to a Mammoth, this animal was in size as a horse to a dog. In the known fossil world there is

but one creature that can be compared at all with it, and this would be only as a child beside it. The famous Brontosaur at the Yale Museum, at New Haven, is its only animal criterion of measurement. This was an animal of its own kind, a fellow-creature in Wyoming, where for millions of years they have laid together in the same deposit. The skeleton at Yale was restored in 1879 by Prof. Reed, under the direction of Prof. Marsh. Beside this monster, the largest Dinosaurs of Europe, and indeed the world, have remained since its discovery as only pigmies. For years the geological students have made pilgrimages to New Haven to study and to marvel at its immense skeleton. This monster is believed to have been 70 ft. in length, and to have weighed perhaps 80,000 pounds in life. Prof. Reed says that, although it is practically out of the question to give an accurate idea of a living Dinosaur, he should think that the animal now being restored would weigh in life sixty tons, that it had a neck 30 ft. in length, and a tail about 60 ft. in length, and the cavity of its body, with lungs and entrails out, would make a hall 34 ft. long and 16 ft. wide; the head of the animal is very small for the size of the body. There is no building in Laramie large enough to hold it, and when taken there, it will probably be placed temporarily on the campus. The work of restoring has been greatly interrupted by snow, but it is being carried on as rapidly as possible. For a great number of years Wyoming has been known to contain some of the world's most wonderful fossil fields, the first discovery dating back to 1858, and since 1877 Wyoming has been known to have the petrified remains of the largest land animals that have ever lived.—L. SMALL (777, Lincoln, Denver, Colorado, U.S.A.).

NOTICES OF NEW BOOKS.

The Last Link. By ERNST HAECKEL (Jena); with Notes and Biographical Sketches by HANS GADOW, F.R.S. Adam and Charles Black.

ONE of the most interesting, and certainly most suggestive addresses delivered at the recent meeting of the International Congress of Zoology at Cambridge, was that of Prof. Haeckel "On our Present Knowledge of the Descent of Man." This has now been published in book form, as above; with many "additions and notes" by the Professor's old pupil, Dr. H. Gadow.

Man's place in Zoology is still, as Huxley described it, "the question of questions for mankind"; and if that remark was true in 1863, it is still more pressing to-day, when, as the author most truly observes: "At the end of the nineteenth century, the age of 'natural science,' the department of knowledge that has made most progress is zoology." The position of man in the animal world is now considered with calmness and discussed with urbanity. It was even quite recently, when brought into line with science, or discussed on an old and dear tradition, described, on one side, as "a tale told by an idiot," or, on the other, as a matter of "sound and fury signifying nothing." Both sides have come nearer to each other with further knowledge, and all who study the question now admit the evidence of an evolutionary plan. Whether that plan is simply the result of natural forces, or an evidence of a design beyond our cognition, is a question not for these pages.

We can only summarise Prof. Haeckel's views on this problem. He considers the celebrated fossil *Pithecanthropus erectus*, discovered recently by Dr. Dubois in Java, as a form which connected primitive man with the anthropoid apes, and as indeed the long-searched-for "missing link." That man was "known with cer-

tainty to have existed as an implement-using creature in the last Glacial epoch. His probable origin cannot, therefore, have been later than the beginning of the Plistocene. The place of origin was probably somewhere in Southern Asia."

In the evolution of man Prof. Haeckel is an advocate of the "heredity of acquired characters." In this he is in distinct antagonism with Weismann and his followers. That this is not the crime against Darwinism frequently advanced is to be gathered from the testimony of the Professor, who states that on the three occasions he visited Darwin "we discussed this fundamental question in complete harmony." The following observations seem incontestable. "If one denies with Weismann the heredity of acquired characters, then it becomes necessary to have recourse to purely mystical qualities of germ-plasm. I am of the opinion of Spencer, that in that case it would be better to accept a mysterious creation of all the various species as described in the Mosaic account."

Zoology has only fulfilled her mission in the discussion of this question. For a long time indeed will she foster the study of "man's place in nature." We are not concerned whether science ultimately solves the problem—absolute truth will probably be the ideal more than the goal of our enquiries; but we may rest assured that "the work done in the present century by Lamarck and Darwin will in all future times be considered one of the greatest conquests made by thinking man."

Zoological Results based on Material from New Britain, New Guinea, Loyalty Islands, and elsewhere. Collected during the years 1895-97. By ARTHUR WILLEY, D.Sc. Lond., &c. Parts I. & II. Cambridge: at the University Press.

THIS is what we venture to designate as a real zoological publication, restricting its scope as purely scientific and technical. Dr. Willey made an expedition to the Pacific in search of the eggs of the Pearly Nautilus, an enterprise, in a biological sense, as much, or more, important than many other belauded expeditions. But science is not justified in all her children. This publication is devoted to the description and elucidation of the general

collections made during this expedition, which, we read, "have no claim to completeness, since they were not part of my special object; but new facts relating to such forms as *Nautilus*, *Peripatus*, *Amphioxus*, *Ctenoplana*, *Balanoglossus*, &c., cannot fail to possess a peculiar interest."

The opening memoir is by Dr. Willey on a species of *Peripatus* which he obtained in the island of New Britain. One interesting fact is here brought out, that whereas formerly, and based on our then knowledge, it was a conclusion that the species of *Peripatus* could be arranged in three groups in accordance with their geographical ranges—*viz.* Neotropical, Australasian, and Ethiopian—the new species constitutes the type of a new group which may be designated Melanesian. The biological strength of this paper is beyond the aim of our pages; but it is not by new species that this journey will be alone remembered. Some animals were procured which, though known to science, were unrepresented in our National collection, such as the rare marine Snake *Aipysurus annulatus*, and Prof. Studer's Echinoderm *Astropyga elastica*. The work, as we announced in these pages (1898, p. 376), will comprise five or six parts; and the first and second have as yet only just reached our hands. Consequently, at present, a detailed review is impossible. Already a good staff of naturalists have commenced to contribute; and the names of Arthur Willey, Paul Mayer, G. A. Boulenger, R. J. Pocock, D. Sharp, Sydney J. Hickson, F. Jeffrey Bell, F. P. Bedford, Arthur E. Shipley, J. Stanley Gardiner, F. G. Beddard, and Isa L. Hiles are guarantees of special work by specialists. The work is beautifully illustrated.

Wild Life at Home: How to Study and Photograph it. By
R. KEARTON, F.Z.S. Cassell & Co., Ltd.

THE well-deserved success of the author's last work, 'With Nature and a Camera,' with its beautiful illustrations of animal life, has induced a wide-spread interest in the method of photographing glimpses of nature. In response to many enquiries, as we are told, the present book is intended to clear the way for the increasing number of those who wish rather to possess realistic photographs than the actual birds or nests. A "technical instructor"

would, however, be a misnomer for this publication, for it contains a host of good zoological observations.

Mr. Kearton has a fair word to say for London Cats. "I have recently seen it stated that the birds of London and its suburbs have decreased because of the Cats and increased population. Whilst recognising the folly of hating a dumb animal merely because it carries into operation an inherited liking for one particular kind of food, I must frankly confess that I do not love Cats; and it will be well to bear this avowal in mind whilst reading the following account of my experiences. This year I have known of the following species of birds having nests and eggs within five hundred yards of a Greater London farmhouse, boasting an army of no less than five adult Cats:—Pheasant, Partridge, Carrion-Crow, Missel-Thrush, Song-Thrush, Blackbird, Starling, House-Sparrow, Hedge-Sparrow, Robin, Wren, Barn-Swallow, House-Martin, Chaffinch, Lark, Whinchat, Red-backed Shrike, Yellowhammer, Moorhen, Lapwing, Great Tit, Blue Tit, Kestrel, Turtle-Dove, Whitethroat." Of course the retort is obvious, that these farm Cats were presumably well fed and housed, and that the worst feline marauders are those houseless and starving brutes which, ill alike for themselves and the birds, haunt the crowded abodes of man.

The author also gives his experience on a question now being discussed in these pages as to the nesting habits of the Moorhen. He states that during his residence in the neighbourhood of Elstree, owing to the depredations of Carrion Crows, "I do not think I can call to mind one instance of a Moorhen succeeding in hatching off her first clutch of eggs. The species has to depend for its perpetuation on the growth of reeds and rushes, which the old birds bend over their nests and thus hide their eggs."

The illustrations, as in Mr. Kearton's previous books, are again very charming: photography more than illustrates—it reveals—nature. No longer are her secrets to be pourtrayed by the imaginative artist; we have now reached the stage of actual representation. In time the traveller must illustrate his books by the aid of the camera, or not at all.

The Fishes of North and Middle America: a Descriptive Catalogue of the Species of Fish-like Vertebrates found in the Waters of North America, north of the Isthmus of Panama.
By D. S. JORDAN, Ph.D., and B. W. EVERMANN, Ph.D.
Washington: Government Printing Office. 1898.

IN 1897 ('Zoologist,' p. 178) we drew attention in these pages to the first part of this great publication. Part II. has now appeared in the shape of another massive volume, bringing up the pagination to a total of 2183, the number of genera described to 798, while the described species are now no fewer than 2510.

In reading the descriptions of the gorgeous and bizarre colouration of many of these fishes, one cannot but feel that some of our speculations as to the meaning and service of animal colouration will have to be qualified by much apparently different piscatory evidence. How suggestive is the following account of the young of the Garibaldi (*Hypsypops rubicundus*), which are of a dusky scarlet, with intensely bright blue markings. "These brilliant little fishes inhabit only large, deep rocky pools, hiding under the seaweed of ledges, and frequently swimming out into the open water of the pool. They are accompanied by the adult, the usual uniform scarlet colour of which appears a distinct lustreless yellow in the water." The fish is common on the coast of California.

Fossil Medusæ. By CHARLES DOOLITTLE WALCOTT. Washington: Government Printing Office.

THIS is one of the monographs of the United States Geological Survey, and forms vol. xxx. of that series. As the author remarks: "To the biologist the suggestion of silicified Medusæ is a violent attack upon his previous conceptions of such organisms, and the possibilities of their preservation as fossils in any other manner than as faint impressions on fine limestone, sandstone, or shale." They, however, occur in a silicified condition, and have been found to belong to the Jurassic, Permian, and Cambrian faunas. Their mode of occurrence in the Middle Cambrian of Alabama "suggests at once the habit of living on a

muddy bottom in great numbers." This monograph not only describes the American remains, but also those of the Jurassic lithographic limestones of Solenhofen, the Permian fossils of Saxony, and those belonging to the Cambrian age in Northern Europe and Bohemia. With the usual ample, we might almost say lavish, manner with which these American governmental publications are issued, this volume is embellished with no fewer than forty-seven plates.

Birds of the British Isles. Drawn and described by JOHN DUNCAN. Walter Scott, Limited.

THIS volume consists of a reprint of pen-and-ink sketches of British birds, with short descriptive notes, contributed by the author weekly during the last ten years to the 'Newcastle Weekly Chronicle.' From an introduction, written by Mr. Charles Dixon, we learn that the author from his childhood has been a lover of bird-life: "And this seems only natural, for he is the son of Robert Duncan, the Newcastle taxidermist, and was consequently brought up in an ornithological atmosphere, and in a house where the family talk was almost invariably about birds."

Consequently this is neither what may be called exactly a work of science, nor a book of reference. It is, however, a publication which in its lengthy serial form must have drawn many of the ardent Newcastle politicians who read the 'Newcastle Weekly Chronicle' away from the views of both Joseph Cowen and John Morley to a more peaceful study of bird-life.

It is a book that many will buy who have never heard of Howard Saunders or his 'Manual,' and therefore will reach a reading public to whom more scientific ornithology is a stranger.

The work has been revised by Mr. Dixon, and is a real standard of skill and industry combined with a true love of nature.

EDITORIAL GLEANINGS.

THERE will be few zoologists indeed to whom the name of Prof. Alleyne Nicholson is unknown, and by whom his text-books have not been used. We greatly regret to see his death recently announced, and to observe the ranks of the older zoologists gradually thinning. Henry Alleyne Nicholson was born at Penrith, Cumberland, in the autumn of 1844, his father being Dr. John Nicholson, who gained considerable distinction as a linguist and philologist, especially in Oriental literature. The son was educated first at Appleby Grammar School, subsequently at Göttingen, and finally at the University of Edinburgh. At the latter University he gained the Baxter Natural Science Scholarship, and when only twenty-five he was appointed (in 1869) Lecturer on Natural History in the Extra-Mural School of Medicine in that city, an appointment which he held till 1871, when he became Professor of Natural History and Botany in the University of Toronto. This post he relinquished in 1874, when he moved to Durham in the same capacity. In 1875 he accepted the Natural History Professorship at St. Andrews. This post he held till 1882, when he was appointed Regius Professor of Natural History in the University of Aberdeen, and here he remained till the end. We need not enumerate his special work, as it will follow him. For the facts and dates of the above appointments we have relied on "R. L." in 'Nature.'

GEORG HERMANN CARL LUDWIG BAUR was born in Weisswasser, Bohemia, Jan. 4th, 1859, and died very early and mentally exhausted on June 25th, 1898. As a palæontologist and zoologist, his life's work was done in America, and in the January number of 'The American Naturalist' Prof. W. M. Wheeler has given a sympathetic obituary notice of the deceased naturalist, with a list of his scientific publications. These number 144, and perhaps one by which he may be best remembered is that in which he expressed the opinion that "the Dinosauria do not exist." He believed that this group is an unnatural one, and is made up of three special groups of archosaurian reptiles which have no close relation to one another. His other most revolutionary enunciation—one since gaining the assent of many well-known workers—is the subsidence theory. "Dr. Baur rejected the hypothesis of the consistency of continents and oceans, and asserted

that the Galapagos, like the Antilles, were formed by subsidence and not by upheaval, and that they were at one time connected with Central America through Cocos Island. This contention Dr. Baur attempted to prove by showing that each separate island has its own peculiar and harmonious fauna and flora—a condition which could hardly exist if the archipelago were of volcanic origin, and had acquired its plants and animals through accidental importation by means of currents from the mainland."

ALFRED HART EVERETT, whose name as a naturalist and collector is so connected with the Malayan region, died last June from fever, combined with dropsy, contracted during his last voyages. An obituary notice has just appeared in 'Novitates Zoologicæ' (vol. v. p. 606), from which we extract the following particulars:—Mr. Everett "was born in 1848, on Norfolk Island, where his father held the post of medical officer; but in 1853 his family settled in England, where he was educated. He began to show a strong taste for natural history at an early age, and it was not long before he conceived the idea of becoming an explorer. With this in view he entered the service of the Rajah Brooke of Sarawak. His work on Borneo in nearly all branches of zoology is too well known to require description. From there he made his successful expeditions to the Philippines, and to Palawan and Balabac, collecting chiefly birds for the late Marquis of Tweeddale. Being aware of Mr. Everett's abilities as a collector, the Editors of 'Novitates Zoologicæ' felt great satisfaction when, during his stay in England in 1894, he offered his services to Mr. Rothschild, and they heartily regret that they are now terminated by his death. Besides collecting birds and insects for the Tring museum, he did much in other branches of natural history during his last voyages. There never was a more ardent zoologist than Mr. Everett, and when on the sick-bed a few days before his death he talked of nothing but birds and mammals, and of zoo-geographical problems and future trips to unexplored islands as soon as he should be strong again."

On the afternoon of January 23rd, a large Porpoise was to be seen swimming in the Thames off Blackfriars Bridge, which was watched by hundreds of persons.—*Daily Chronicle*.

"TAXIDERMIST."—Who is responsible for the invention of this vile phrase? It is not in Johnson's 'Dictionary.' I suppose we get it from the French. It would have been easy to suggest a more regular formation, such as "taxidermatist," or more correctly "dermatotaxist," or even "dermataxist." But scientific people are above such matters, and seem to condemn them.—JULIAN MARSHALL (*Notes and Queries*, Jan. 14th).

